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## BEEF PRODUCTION ON THE FARM

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**B**EEF CATTLE are well suited to farms which have sufficient nontillable land or other low-priced land suitable for pasture purposes and a sufficient acreage of crop land for production of the grain and roughages needed for wintering and fattening purposes.

On farms where the sale of beef cattle provides the major portion of the farm income the breeding herd should be large enough to provide at least one carload of cattle for sale each year.

Ordinarily, under farm conditions with adequate feed and proper care, one mature bull will be needed for 30 to 40 cows.

An income may be derived from the sale of milk or cream as well as from beef by using beef-type cows with pronounced milking tendency.

Uniformity in type and quality of offspring is an aid in marketing.

Highly bred beef calves may be developed into desirable beef by weaning time if they are creep-fed grain on good pasture.

This bulletin supersedes Farmers' Bulletin 1073, Growing Beef on the Farm.

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# BEEF PRODUCTION ON THE FARM

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## DEVELOPMENT OF BEEF CATTLE IN THE UNITED STATES

CATTLE have been raised and used for beef on farms in the United States almost from the time of the first settlement. For a long period there was a large surplus of beef for export, and while that no longer exists, the major portion of the beef consumed by our citizens is produced within the present boundaries of our country. The once seemingly limitless area of open range where large numbers of our beef cattle have been raised has been gradually restricted by the expansion of productive farming areas and the extension of fenced holdings. The reduction in carrying capacity of the open range, together with the great increase in the Nation's population, has led to the development of present-day methods of beef production.

Formerly the bulk of the cattle which went to market were 5 and 6 years old, but now a very large percentage are 2 and 3 years old, and some are fat enough for high-grade beef at less than 1 year of age. A large percentage of the surplus stock from the breeding herds on the ranges in the Western States is shipped to central markets for slaughter. Considerable numbers are moved to Corn Belt farms where they are fed principally farm-grown crops for a few months until a high degree of finish is obtained.

Many farms are so situated as to make it economically advisable to raise as well as to fatten beef cattle. For example, a farm may have a large proportion of its area composed of woods or rough, broken, or otherwise nontillable land which is suitable for grazing (fig. 1). If this pasture is fenced, the breeding herd and stock cattle may be pastured there during the grazing season without need for much farm labor. The labor may be devoted to the production of feed crops, perhaps some cash crops as well and possibly in connection with other enterprises also. These other enterprises, such as feeding steers for market, producing whole milk or cream, and raising hogs or poultry, may be supplemental to the main one.



The production of fat yearlings from a herd of beef cows which have a marked milking tendency is another type of operation. Beef cows with that tendency may be classed as dual-purpose cows. The systems of management for such cows and calves are discussed later.

### THE BREEDING STOCK

Opinions differ as to the breed of cattle best suited for farm beef production, although under ordinary farm conditions and with proper care and feeding any of the leading beef breeds should give good results. Accordingly, selection of a particular breed is largely based on individual preference. The principal breeds of beef and dual-purpose cattle in this country today are discussed in Farmers' Bulletin 1779, Beef Cattle Breeds.

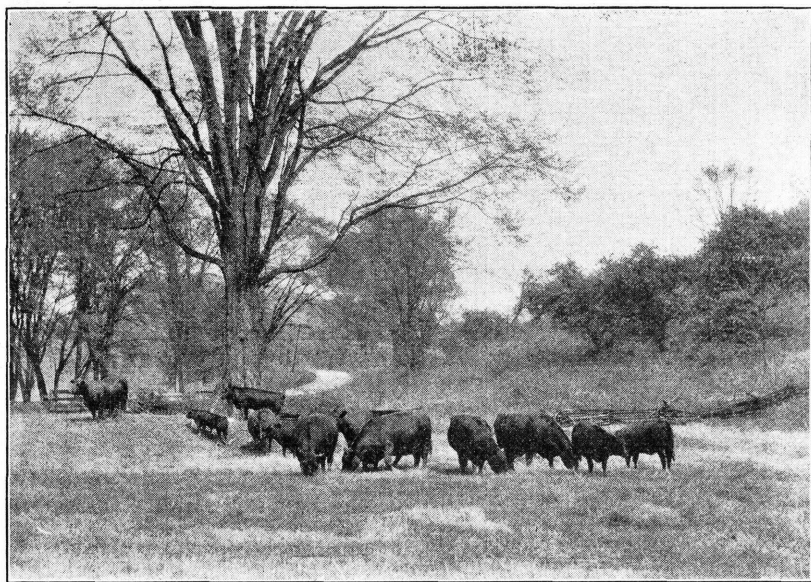


FIGURE 1.—Aberdeen Angus cows and calves grazing on land well adapted for use as pasture.

One who contemplates raising beef cattle on a farm will do well to read the above-mentioned bulletin and also to visit farms where herds of beef cattle are being handled on a commercial basis, in order to have a better understanding of the business. It is generally advantageous to raise cattle of one of the breeds already in the community. If this procedure is followed it is often possible to reduce overhead expense by exchanging bulls with neighbors or by entering into community or association ownership. Moreover, the latter arrangement may make it possible to have a higher-quality bull than could be afforded by individual purchase.

If it is desired to obtain an income from the sale of milk or cream as well as from cattle fattened for market, breeding stock showing pronounced milking tendency should be selected (fig. 2).



## THE HERD BULL

A healthy, registered bull displaying quality in a high degree and at the same time representing approved type for the breed selected is



FIGURE 2.—Shorthorn cows of beef type with pronounced milking tendency.

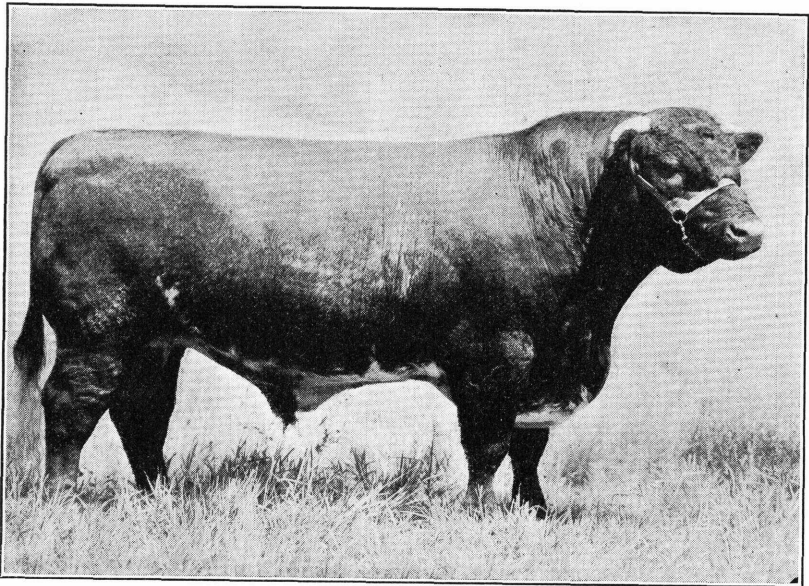


FIGURE 3.—Shorthorn bull. A good example of suitable type of farm herd sire.

needed to head the grade herd being maintained for the production of beef (fig. 3). Although such a sire may have proved satisfactory, it becomes necessary after a few years to replace him because he has



outlived his usefulness or must be removed to avoid inbreeding. Better results will then be obtained with a bull of similar blood lines, provided, of course, that he has desirable quality, scale, and conformation. This practice tends toward the production of calves of uniform type and quality. It is, therefore, an aid both in the selling of stock and in selecting heifers raised on the farm to replace the cows in the herd.

A common practice in buying a bull is to seek one of serviceable age which is known to have sired desirable calves. Although that is sound procedure there are advantages to be gained by purchasing a yearling bull of the desired breeding and type and guaranteed to be a breeder. For example, the purchase of a young bull affords the



FIGURE 4.—A uniformly good lot of heifers is the result of careful selection of breeding stock and adequate feed.

purchaser a wider selection and may also mean a smaller cash outlay. In addition, the purchase of a young bull a year before he is actually needed for service makes it possible to give him the advantage of liberal feeding and extra care. Moreover, in case of a marked change in environment, this procedure affords sufficient time for him to become acclimatized.

#### BEEF COWS

It is desirable that the number of beef cows be large enough to enable the owner to market at least one carload of cattle each year and also to provide heifers for replacement of cows in the herd. A few heifers will be needed nearly every year to fill the vacancies in the breeding herd brought about by injury, old age, and irregular breeding of cows (fig. 4).

The size of the herd above the minimum number of cows required for successful operation will depend upon the amount of pasture and the quantity of hay and other feed crops produced on the farm for use in wintering stock and in fattening cattle for market. Where the raising of beef cattle on the farm is practicable, pasture is obviously the cheapest feed. The extent and carrying capacity of the pasture and facilities for wintering stock cattle will largely determine whether it is possible to winter the yearlings so they may be fed out and sold as 2-year-old cattle or whether it is best to begin the fattening process early so as to market them as fat yearlings.

#### DUAL-PURPOSE COWS

Cows with pronounced milking tendency will provide an income from two sources; namely, from the sale of their offspring and from the sale of dairy products. They should possess the characteristics of the beef cow and also the milking tendency to a degree sufficient to produce a substantial quantity of milk or cream for a period of several months. Their calves may be raised either by the double-nursing system or by teaching them to drink milk from a bucket. Considerable care must be exercised in the selection of these cows and heifers in order to hold the individuals comprising the herd to beef type and milking tendency as well.

#### FEEDING AND MANAGEMENT OF THE HERD

##### EQUIPMENT FOR THE BREEDING HERD

The equipment for the breeding herd need not be very extensive. Troughs to provide for a supply of fresh, clean water for all the stock, sufficient material to provide a securely fenced pasture for the bull and for the herd are among the most essential features. In addition, shelter should be provided to protect the cattle during severe weather and especially for breeding cows that calve in the winter and early spring months. Stock can endure severe weather without suffering if they are well fed and have access to a dry place. Every effort should be made to provide good drainage for the lots.

##### FEEDING AND CARE OF THE HERD BULL

The herd bull should not be allowed to run with the cows during the entire year. A separate enclosure should be provided for the bull, if possible. However, he may be turned out on pasture with the steers after the breeding season if no provision can be made to keep him in a pasture by himself.

When the bull is to be put in heavy service, as, for example, when breeding for spring or fall calves, he will probably need a little extra feed for about 30 days in advance and also during the breeding season in order to be in good breeding condition (fig. 5). For this purpose a few pounds of grain mixture and possibly a little protein concentrate, such as linseed meal or cottonseed meal or cake, is satisfactory. The grain mixture may be composed of corn or barley, 2 parts, and bran and oats, 1 part each by weight. The quantity of grain mixture to be fed will be determined by his condition, but should not exceed the proportion of 1 pound of grain to each 100



pounds of live weight. One-half or two-thirds of this amount will usually be satisfactory. For example, a 1,400-pound bull on good bluegrass pasture will keep in excellent breeding condition with about 10 pounds of the grain mixture per day. In winter, when there is no pasture, he will probably do well with about 30 pounds of silage, 10 pounds of good-quality alfalfa or other legume hay, and 12 pounds of grain mixture. If a protein concentrate is fed, 1 or 2 pounds per day will ordinarily be sufficient, but in any event not over 4 pounds per day should be fed.

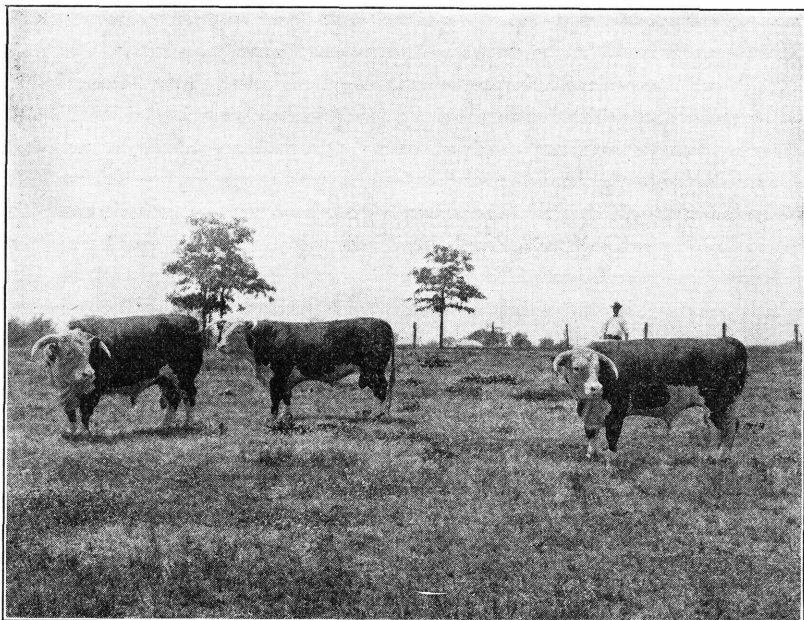


FIGURE 5.—Hereford bulls in thrifty condition. These bulls represent desirable types for farm herds.

If it is advisable to keep the bull in a thrifty breeding condition throughout the year, he will need space for exercise when not on pasture. Green pasture will meet a considerable portion of the requirements. In the absence of pasture, a lot or corral will provide space for exercise, but the ration should contain green feed, silage, or carotene-rich root crops such as carrots and sweetpotatoes. Some legume hay is necessary in the absence of any of the above carotene-rich feeds, but considerable straw or stover with a little grain and cottonseed cake, linseed meal, or other protein concentrate may be fed.

A bull in good breeding condition is likely to be somewhat temperamental. If he has been dehorned he will be somewhat easier to control, but under no circumstances should he be trusted. The more docile and gentle he appears the more careful should be his attendant.

The fence around the lot or corral in which the bull is kept should not prevent him from viewing other cattle but should be very securely constructed.

#### FEEDING AND CARE OF THE COW HERD

A farm with an adequate summer and winter pasture for the breeding cows is excellently situated when it also has land available for the production of crops which are suitable for fattening cattle.

In early spring or at other times when the grass is exceedingly succulent, the cows will do better if they are supplied with some hay or other dry roughage. As a rule, strictly beef cows will not require supplemental feed while they are grazing good growing pasture. However, cows that are being milked will frequently show better returns if they are fed grain each day at the rate of about 2 pounds to each gallon of milk they give.

Late in the summer or in the fall, when the grass is maturing, the feeding of a legume hay or protein concentrate is advisable.

Silage or stock carrots can be used in the ration for breeding cows when they are not on pasture. However, some kind of green-colored, leafy, legume hay will be needed to form a suitable ration. When either bright, wholesome straw or stover is available, it may replace a considerable portion of the legume hay. Approximately 5 pounds of green-colored leafy hay is usually sufficient in such a ration to satisfy the vitamin A requirements. Such a combination will ordinarily contain the necessary nutrients and provide bulk and variety as well. However, it may prove advisable to supply a mineral mixture such as that described on page 15.

For dry, pregnant cows weighing about 1,000 pounds, the following rations are suggested:

#### RATIONS FOR DRY, PREGNANT COWS

1	Pounds	4	Pounds
Corn or sorgo silage-----	30	Alfalfa or clover hay-----	5
Alfalfa hay-----	5	Mixed or grass hay-----	15
Straw-----	Unlimited	Barley-----	2
2		5	
Sugar-beet pulp-----	40	Corn or sorgo silage-----	30
Alfalfa hay-----	5	Oat or barley hay-----	10
Corn stover or grain hay-----	10	Barley-----	2
3		6	
Corn or sorgo silage-----	35	Sorgo silage-----	40
Corn or sorghum stover <sup>1</sup> -----	10	Lespedeza or pea-vine hay-----	5
Cottonseed meal or linseed meal---	1	Velvetbeans in pod-----	2

<sup>1</sup> Cottonseed hulls may be substituted for stover providing the meal is increased to 1½ pounds.



TABLE 1.—*Gestation table for cows (283 days)*

Day of month bred	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Explanation: Find date cow was bred in first column and month bred in top line. The date in column below opposite date bred will be the time at which the cow is due to calve												
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	11	9	9	8	11	10	11	11	11	11	10
2	12	12	10	10	9	12	11	12	12	12	12	11
3	13	13	11	11	10	13	12	13	13	13	13	12
4	14	14	12	12	11	14	13	14	14	14	14	13
5	15	15	13	13	12	15	14	15	15	15	15	14
6	16	16	14	14	13	16	15	16	16	16	16	15
7	17	17	15	15	14	17	16	17	17	17	17	16
8	18	18	16	16	15	18	17	18	18	18	18	17
9	19	19	17	17	16	19	18	19	19	19	19	18
10	20	20	18	18	17	20	19	20	20	20	20	19
11	21	21	19	19	18	21	20	21	21	21	21	20
12	22	22	20	20	19	22	21	22	22	22	22	21
13	23	23	21	21	20	23	22	23	23	23	23	22
14	24	24	22	22	21	24	23	24	24	24	24	23
15	25	25	23	23	22	25	24	25	25	25	25	24
16	26	26	24	24	23	26	25	26	26	26	26	25
17	27	27	25	25	24	27	26	27	27	27	27	26
18	28	28	26	25	25	28	27	28	28	28	28	27
19	29	29	27	27	26	29	28	29	29	29	29	28
20	30	30	28	28	27	30	29	30	30	30	30	29
21	31	Dec. 1	29	29	28	31	30	31	July 1	31	31	30
22	Nov. 1	2	30	30	Mar. 1	Apr. 1	May 1	June 1	2	Aug. 1	Sept. 1	Oct. 1
23	2	3	31	31	2	2	2	2	3	2	2	2
24	3	4	Jan. 1	Feb. 1	3	3	3	3	4	3	3	3
25	4	5	2	2	4	4	4	4	5	4	4	4
26	5	6	3	3	5	5	5	5	6	5	5	5
27	6	7	4	4	6	6	6	6	7	6	6	6
28	7	8	5	5	7	7	7	7	8	7	7	7
29	8	-----	6	6	8	8	8	8	9	8	8	8
30	9	-----	7	7	9	9	9	9	10	9	9	9
31	10	-----	8	-----	10	-----	10	10	-----	10	-----	10

## BREEDING FOR SPRING AND FALL CALVES

The period of gestation for cows is about 283 days, or roughly, about 9½ months. Accordingly, when it is planned to produce spring calves, the cows should be bred as near the month of July as possible. Likewise, in order to obtain fall calves, the cows may be bred in January or February. The advantages derived from uniformity in age and conformation when stock are offered for sale make it particularly desirable to breed all the cows in as short a period as possible. Seasonal activities on the farm as well as the availability of pasture and the crop situation may influence a person in choosing the time of the year best suited to handling young calves. Accordingly, having determined upon the time of the year calves are desired, one need only refer to table 1 to learn when the cows should be bred.

When cows are grazing good growing pasture they are not likely to require extra care at calving time. They will usually seek a quiet spot somewhat apart from the herd and there drop their calves in a normal manner. Occasionally it may be necessary to help a newborn calf to get its mother's milk for the first time, but unless some unusual difficulty develops, it is best not to disturb the cow. In severe weather, however, it is well to confine the cow which is about to calve in a dry, sheltered place. It is particularly desirable to include silage or root crops in the ration at this time. Linseed meal or bran mash may be added to the ration a few days before calving takes place and continued for several days afterward. These feeds

are of material benefit when a dry ration is being fed. A ration is termed "dry" when it contains no fresh green feed, silage, root crops, pomace, or beet pulp. The quantity of grain should be reduced about one-half a few days previous to calving if the cow is in good condition, but gradually increased afterwards until the normal amount is again being fed.

If the calf does not immediately begin breathing when it is born, any mucus in its mouth or nostrils should be wiped out. Natural breathing may be induced either by forcing air into the lungs with a bellows or by alternate compression and relaxation of the walls of the chest.

Soon after the calf is born the cow should be given all the lukewarm water she desires. Cold water is too severe at such a time. A small feed of bran mash is also beneficial at this time. If the cow is an exceptional milk producer she may have more milk than the calf can take during the first day or two; in that case the udder should be milked out after the calf has finished.

#### FEEDING AND MANAGEMENT OF CALVES

Calves which are running with their dams on good pasture generally do well without extra attention. Calves from cows which are to be milked will not need to have their own dam's milk for more than 4 or 5 days. They may then be raised either by the double-nursing system or by being taught to drink milk from a bucket.

#### CALVES FROM DUAL-PURPOSE COWS

With the double-nursing arrangement two calves of approximately the same age are suckled by one cow. This practice permits the calves to get along nearly as well as those with their own mothers in a strictly beef herd, although it involves considerably more labor. With this plan in operation, one-half of the cows in the herd may be used for the production of milk.

With the other method the calves are taken from their dams on the fourth or fifth day after birth and are taught to drink milk, first permitting the calf to suck the feeder's fingers and then immediately immersing the fingers in the milk. When the calf begins to take the milk in this way, the hand may be withdrawn from the bucket. After each feeding the buckets and other utensils used should be cleaned and scalded. If there is sunshine, it is a good plan to place the equipment where it will be exposed to the sun for several hours.

Three or four pounds of whole milk are sufficient for the first day or two, but if the calf should refuse to drink, no effort need be made to force it to drink, the better plan being to take the milk away. Twelve hours later, at the next feeding time, the calf will more than likely be ready to take the milk. The quantity may be slowly increased by about a pound a day until the calf is getting 8 to 10 pounds a day, depending upon its size and ability to handle the milk. Overfeeding should be avoided. It is much easier to prevent digestive disorders that are frequently the result of overfeeding than to correct the difficulty and bring the calf back to normal.

After whole milk has been fed for about 2 weeks, it may be gradually replaced with skim milk. Skim milk, however, contains less energy and is particularly lacking in vitamin A producing materials in comparison with an equal weight of whole milk. It is a good plan, therefore, to feed a small quantity of cod-liver oil or other fish oil rich in vitamin A, but 2 teaspoonfuls a head daily will satisfy the calf's requirement for this important nutrient. If the current price of whole milk is so high as to make limited use of it imperative, the substitution of skim milk may be undertaken when the calves are about 10 days old. At this time about 2 pounds of whole milk should be replaced by the same amount of skim milk each day. In 5 to 7 days the substitution of skim milk may be continued at an increase of 1 pound each day. If there is sufficient skim milk available, the quantity per calf may be gradually increased every week until 15 to 20 pounds are being fed. However, from 12 to 14 pounds will be sufficient when there is occasion to conserve the milk supply, provided the calves are fed an adequate amount of suitable grain mixture, a protein supplement, and good-quality hay.

Feeding the vitamin A rich oil may be discontinued after the calf has begun to eat hay, silage, or grass, provided the hay is green and leafy or the silage or grass has some green color. If the quality of the hay is low or if the silage or grass lacks a good green color, it is best to continue to feed the vitamin A rich oil. It may be less expensive, however, to buy a small quantity of green-colored, leafy hay for supplying the necessary vitamin A material to calves several months old, since only 2 or 3 pounds of hay high in carotene will usually satisfy the vitamin A requirement of young cattle.

Clean, fresh water and salt should be accessible to the calves at all times.

The calves will readily learn to eat grain and should have a limited quantity each day from the time they are about 3 weeks old. A suitable grain mixture may be made of equal parts, by weight, of wheat bran, ground oats, and coarsely ground corn. In sections where barley costs less than corn of the same quality, it may be used in place of corn. If barley is fed, it should be coarsely ground or rolled.

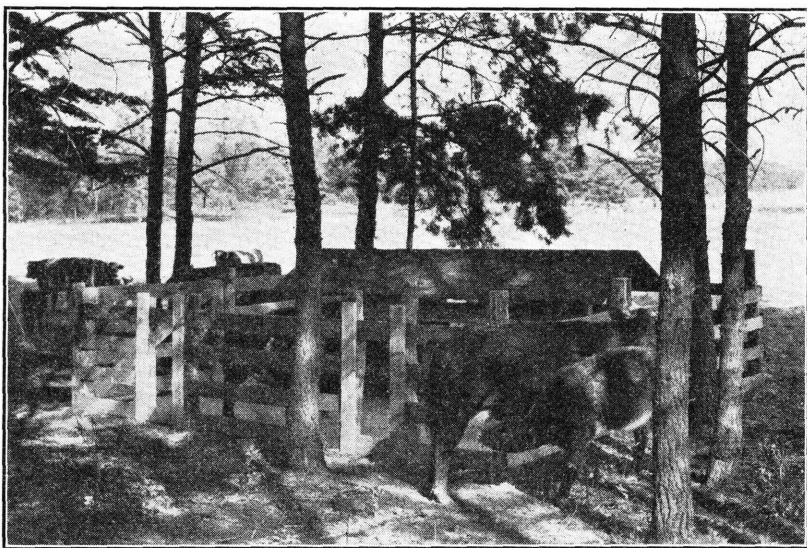
At first only a handful of the grain mixture need be fed to each calf. When the calves have learned to eat the grain the quantity may be gradually increased to about one-fourth pound per head per day and should be fed in a small fenced enclosure known as a creep (figs. 6 and 7). There should not be any grain left from one feeding to the next. If this does occur, it is an indication that too much has been fed. Accordingly, the surplus should be removed and less fed the next time. The boxes or bunks in which the grain is fed should be kept clean and free from moldy or fermenting grain, because feed in such condition is unwholesome and is likely to cause digestive disorders.

As soon as possible the calves should have access to pasture. In the event that pasture is not available by the time the calves are about a month old either some growing crop may be cut and fed to them, or they may be given a small quantity of silage or carrots. Calves running on green pasture or confined in a lot or corral should have access to a little clean, bright hay which may best be fed in

a rack. Clover, lespedeza, alfalfa, or other green-colored leafy legume hay is very desirable for calves restricted to a dry lot. If these are not available, a little freshly cut green grass or good-quality grain hay each day and about a quarter of a pound of protein concentrate every 2 or 3 days will be satisfactory. Meals such as linseed, soybean, copra, and peanut and gluten feed are suitable protein concentrates. If cottonseed meal is to be used, it would be well to feed it sparingly to young calves.

#### FEEDING GRAIN TO SUCKLING CALVES

By the time suckling calves that are grazing with their dams are 3 weeks old it should be decided whether they are to be marketed about weaning time or placed in a small enclosure at weaning time and fed for about 6 months so as to fatten for market.



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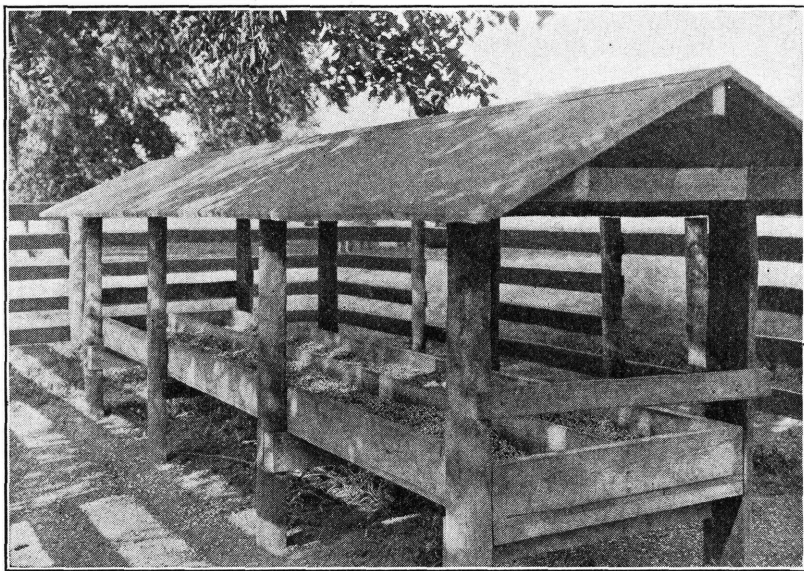
FIGURE 6.—A form of creep suitable for feeding grain to calves that are running with their dams. Note the two small openings that are large enough to admit the calves but not the dams.

If calves are to be marketed at weaning time or shortly thereafter it is well to begin feeding them grain within a creep when they are 3 or 4 weeks old. This practice is desirable both because of their efficient use of feed resulting in greater selling weight and because of the better finish they will have when marketed. It is good practice to locate the creep near shade trees or in the vicinity of the watering place, preferably on ground which is well drained. The openings in the fence which forms the creep should be large enough to admit calves but small enough to keep out cows. A 6-inch board may be placed across each of the openings about a foot from the ground, to keep out hogs, yet low enough to allow calves to enter. (Note opening in fence at the right (fig. 7).)



Beef calves of good quality should gain about 2 pounds a head daily when creep-fed an average of 4 pounds of a grain mixture over a period of about 6 months. A mixture of 2 parts of shelled corn and 1 part of whole oats, by weight, is suitable for the first 3 months of feeding. Thereafter the mixture should be composed of 5 parts of shelled corn, 2 parts of whole oats, and 1 part of linseed meal, by weight.

One-fourth of a pound a head should be fed in the creep the first 2 or 3 days and the quantity then gradually increased so as to average about 1 pound a head daily, during the first 30 days of feeding. Thereafter the grain may be increased gradually until by



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FIGURE 7.—Grain may be fed to calves which are running with their dams by means of a feed bunk placed inside a creep. Note that feed bunk is covered to keep out the rain and set low so that calves may easily reach the grain.

the end of the fifth month of creep feeding the calves will be consuming about 8 pounds a head daily. Probably not more than half of this quantity will be required if the pasture is exceptionally good and the dam affords the calf a liberal supply of milk throughout the suckling period.

When calves are to be fattened in the dry lot after weaning, creep feeding on grass during the entire suckling period is not recommended, though a modification of this practice may be worth while. For example, if pastures should become short, it would doubtless be well to creep-feed prior to weaning and subsequent dry-lot finishing, so as to avoid loss of calf fat commonly known as bloom.

A discussion of the feeding and care of calves, raised for breeding stock, from the time they are 6 months old is contained in Farmers' Bulletin 1135, *The Beef Calf: Its Growth and Development*.

### WEANING CALVES

The weaning of calves is comparatively simple. The milk is usually withdrawn from the ration of the bucket-fed calves by the time they are from 6 to 7 months old, but if they have learned to eat hay and grain the quantity of milk fed may be greatly reduced several weeks earlier without stunting the calves. Reduction in the milk supply should be made gradually. For example, 1 pound may be withdrawn on the first and second days, 2 on the third, fourth, and fifth days, and thereafter 1 pound more each day until weaning is complete.

As the calves grow older their grain ration may be slowly increased. The quantity of grain they will need depends on the quantity and kind of other feeds given them. Calves which are kept from their dams, except for a few minutes twice a day while they are permitted to nurse, will make better growth if they learn to eat a little grain mixture and legume hay of good quality when they are about 3 weeks old. At this time the grain mixture may be composed of equal amounts by weight of corn (preferably yellow), crushed oats, and bran. When calves are confined to a dry lot they may learn to eat the grain a little more readily if an older calf that has learned to eat is placed with them.

The weaning of calves which are running with their dams on pasture may be brought about by confining them in a pen out of sight of the other cattle and permitting them to have only one feed from the dams each day for about a week. After that let them feed every other day for three or four times. If the cows are still giving considerable milk and appear to be distressed by swollen udders, some milk may be drawn to relieve the congestion. Otherwise it will be necessary to delay the completion of the weaning process for a week or more.

### DEHORNING AND CASTRATING

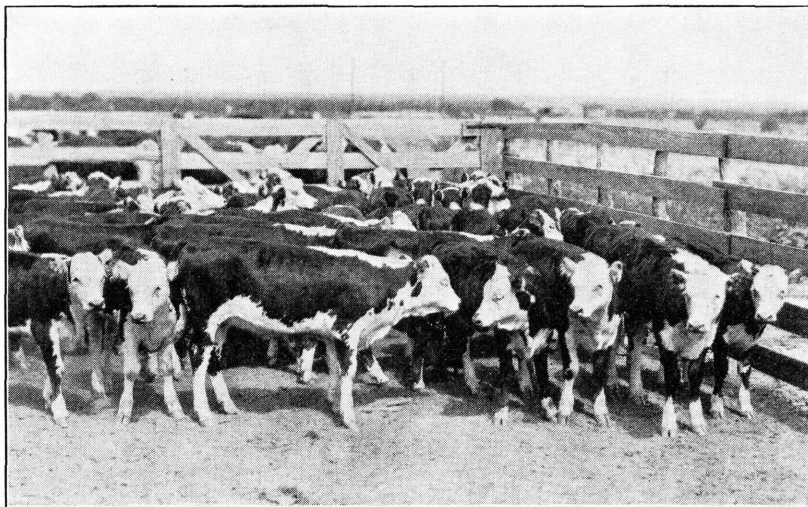
Unless polled cattle are being raised it is certainly advisable to dehorn the calves (fig. 8). This should be done before the calves are 3 weeks old. At that early age when the tender horn "buttons" first appear, they may be irritated by scraping with a knife blade and the growth of horn prevented by careful application of the tip of a caustic pencil (stick of potassium hydroxide) which has been slightly moistened at the tip. The action of the caustic causes a scab to form on the irritated area. The scab shrivels and falls off after a few days, leaving a hornless or "polled" head. Detailed instructions for dehorning cattle with a saw, clippers, or with gougers, as well as preventing the growth of horns on young calves by the use of caustic, are contained in Farmers' Bulletin 1600, Dehorning, Castrating, Branding, and Marking Cattle.

Castration of all male calves in the grade herd is necessary for the production of the best beef. The operation should be performed preferably at a time of the year when flies are not prevalent, but as near the age of 3 to 4 months as possible.

The spaying of heifers is practiced only to a limited extent, but should never be undertaken until after the most thrifty heifers with the desired type and quality have been selected and set aside for



possible use as replacements in the breeding herd. It is wise to select one or two more heifer calves than it is thought will actually be needed for replacement, so as to permit still further selection when the breeding herd is formed.



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FIGURE 8.—Calves of good quality will convert suitable supplemental feeds into high-grade beef. These Hereford calves were dehorned at an early age.

#### WINTERING CALVES

For wintering calves weighing about 400 pounds, which will not be put into the feed lot until they are long yearlings, one of the following rations is suggested.

##### RATIONS FOR WINTERING CALVES

1	Pounds	4	Pounds
Corn or sorgo silage.....	12	Corn or sorgo silage.....	15
Alfalfa, clover, soybean, or cow-pea hay.....	5	Timothy, rye, or mixed hay or stover.....	6
		Cottonseed meal or linseed meal.....	$\frac{1}{2}$
2		5	
Corn or sorgo silage.....	15	Corn or sorgo silage.....	15
Oat, rye, or wheat straw.....	15	Lespedeza or pea-vine hay.....	10
Cottonseed meal or linseed meal.....	1	Velvetbeans in pod.....	4
3		6	
Corn and soybean silage.....	15	Lespedeza or pea-vine hay.....	7
Corn stover or straw.....	6	Grass hay, straw, or stover.....	2
Cottonseed meal or linseed meal.....	$\frac{1}{2}$	Cottonseed meal, linseed meal, or peanut meal.....	1

The foregoing rations are intended mainly to serve as a guide to one unfamiliar with feeding practice. It should be remembered that there is a great difference between individuals and between

groups of cattle under various conditions, and also that some feeds deteriorate in storage so that it requires considerable judgment to feed successfully.

#### SALT AND OTHER MINERAL REQUIREMENTS

Clean, fresh water and a supply of salt should be accessible to stock at all times. About 2 pounds of salt per head per month is ordinarily satisfactory. Of course, calves require less than that quantity, while heavy steers on full feed or mature cattle need a little more than 2 pounds per head per month.

Breeding or young, growing beef cattle receiving an adequate quantity of suitable feeds seldom need a mineral supplement in addition to salt, particularly if they are afforded a variety of feeds, including legumes. Nevertheless, if cattle are either pastured or fed principally

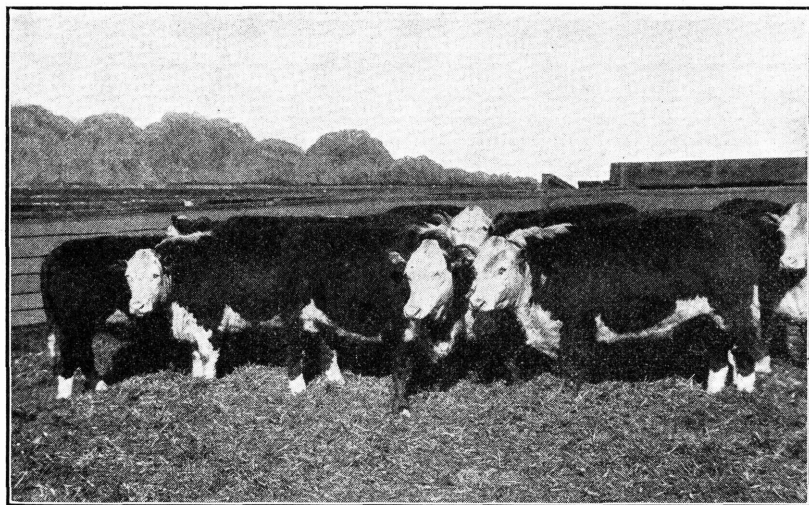


FIGURE 9.—Fat steers highly finished in the dry lot for market.

on crops grown in soil known to be deficient in calcium or phosphorus, they will probably not get enough of these elements to meet their requirements. Moreover, pregnant cows, nursing cows, or cows of the dual-purpose breeds if fairly heavy milkers may need more of these minerals than they usually obtain in their regular feeds.

A mixture of 5 parts by weight of finely ground limestone and 5 parts of sterilized bonemeal, with 1 part of salt added to make the mixture more palatable, should be satisfactory.

#### FEEDING CATTLE FOR MARKET

On most of the farms where beef cattle are raised it will be practicable to fatten them for market (fig. 9). When corn, barley, or kafir grain and a legume hay are grown, one of these grains and the hay will constitute effective economical feeds for fattening young cattle. Other feeds which may be used satisfactorily are mentioned

in Farmers' Bulletin 1549, Feeding Cattle for Beef, which gives details for feeding and handling weaned calves and older cattle to be fattened for market.

#### SANITATION AND DISEASE PREVENTION

Cattle which have access to clean, fresh water and are not confined to muddy lots or dark, damp quarters are less likely to become subject to the more common diseases. Simple precautions accompanied by vaccination against blackleg, and if necessary against anthrax also, are not expensive, and are good insurance. Information pertaining to the more common diseases of cattle and their prevention as well as the eradication of infestations of external and internal parasites is available in bulletin form.